

Trend Study 2-38-01

Study site name: Twin Creek.

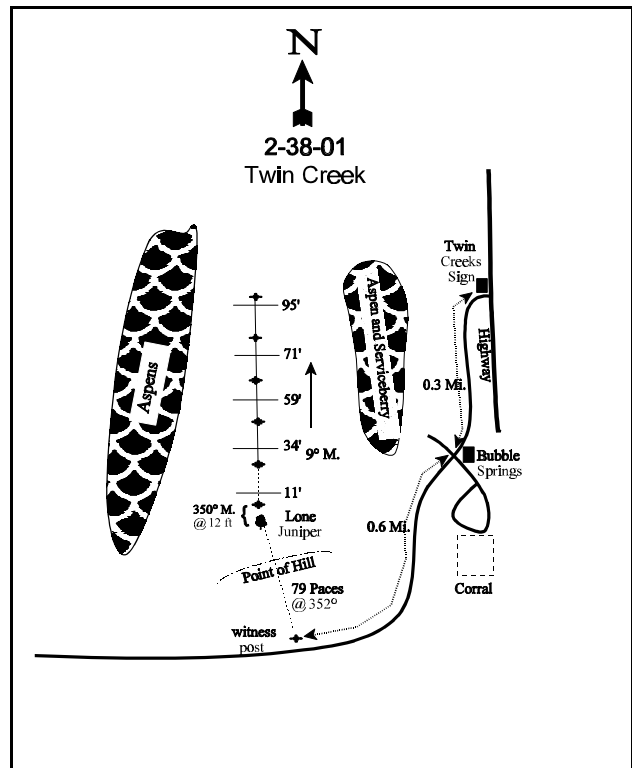
Vegetation type: Mountain Brush.

Compass bearing: frequency baseline 9 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

Take the Twin Creek turnoff off of U.S. 89 and proceed 0.3 miles to the Bubble Springs turn. Go right for 0.6 miles to a witness post. From the witness post walk 74 paces at a bearing of 352 degrees magnetic to a lone juniper. From the juniper, the 0-foot baseline stake is 12 feet away at a bearing of 350 degrees magnetic. The baseline runs up the slope at 9 degrees magnetic.

Map Name: Temple PeakTownship 13N, Range 3E, Section 3

Diagrammatic Sketch

UTM 4634536 N, 451703 E

DISCUSSION

Trend Study No. 2-38

The Twin Creek trend study was established in 1996, east of the Twin Creek corrals. This site was established to monitor elk concentrations during the winter months. The study is on a south aspect with a 30% slope and an elevation of 6,500 feet. Elk pellet groups were fairly abundant with a quadrat frequency of 28% in 1996 and 18% in 2001. Sign of cattle, sheep, and deer have also been encountered. Moose sign was observed on the site but not within the sampled quadrats in 1996. Pellet group transect data collected on the site in 2001 estimated 42 elk days use/acre (103 edu/ha), 6 deer days use/acre (15 ddu/ha), and 3 cow days use/acre (7 cdu/ha).

The soil is moderately shallow and rocky, similar to most of the sites in this general area. Effective rooting depth (see methods) was estimated at 13 inches in 1996. Soil texture is a loam with a slightly acidic soil reaction (pH of 6.3). Organic matter is high at 6.5%. Bare ground was low in 1996 at 5%, increasing to 11% in 2001. Much of the bare soil in 1996 was caused by gopher activity. Vegetation and litter cover are high and well dispersed, effectively limiting erosion. An erosion condition class determined soils to be stable in 2001.

The site supports a variety of palatable and preferred browse including serviceberry, mountain big sagebrush, chokecherry, bitterbrush, and snowberry. Of these species, only mountain big sagebrush and snowberry are very abundant. Mountain big sagebrush had an estimated density of 1,460 plants/acre in 1996, with mature plants making up the majority of the population. Recruitment from the young age class was good at 18%, but there were nearly twice as many dead plants as there were young. In 2001, density was estimated at 1,260 plants/acre, the decrease resulted from the loss of young plants. Dead plants still outnumber the young age class in 2001. Use was moderate in 1996, decreasing to a lighter level in 2001. Vigor is good and percent decadence is low at 3% and 8% in 1996 and 2001 respectively. Some plants were chlorotic in 1996, yet seed production was good. Sagebrush annual leader growth was relatively low in 2001, averaging only 2 inches. Snowberry had an estimated density of 1,220 plants/acre in 1996, 18% of which were heavily hedged. In 2001, density was estimated at 1,060 plants/acre. Mature plants make up the majority of the population. Young plants numbered 120 per/acre in 1996, but no young plants were sampled in 2001.

The highly preferred shrubs, bitterbrush and serviceberry, are found in small numbers which are understandably heavily hedged. Bitterbrush numbers 180 plants/acre in 1996 and 2001. In 2001, percent decadency increased from 11% to 22%. Poor vigor also increased from 0% to 22%. Bitterbrush annual leader growth averaged just over 3 inches. Serviceberry density was estimated at 20 plants/acre. These were heavily hedged with their leaves covered with a rust fungus in 1996. Serviceberry annual leader growth averaged nearly 4 inches in 2001. Narrowleaf low rabbitbrush is the most abundant shrub on the site with an estimated density of around 2,200 plants/acre in 1996 and 2001. The population is almost entirely mature and does not appear to be increasing.

The herbaceous understory is abundant and diverse. Grasses and forbs combined to produce half of the cover on the site in 2001. Grasses are represented by 10 perennial and one annual species. Bluebunch wheatgrass and Kentucky bluegrass are the dominant species, together providing 75% of the grass cover in 2001. Bluebunch wheatgrass remained at a stable nested frequency, while Kentucky bluegrass significantly increased in nested frequency in 2001. Sandberg bluegrass, slender wheatgrass, bulbous bluegrass, oniongrass, mountain brome, and Great Basin wildrye are also present. Cheatgrass was rarely encountered in 1996 and was not sampled in 2001. Forbs are diverse, but unfortunately, weedy species dominate the composition. Perennials include mulesears wyethia, yellow salsify, pacific aster, and bastard toadflax. Arrowleaf balsamroot is the most abundant desirable species. In 2001, annual species decreased in sum of nested frequency due to the extended drought. However, they still remain abundant on the site.

1996 APPARENT TREND ASSESSMENT

Vegetation and litter cover are abundant and well dispersed on the site. Erosion is not currently a problem. Trend for soil appears stable. The browse trend also appears stable for the key species. Decadency rates are low and recruitment is good. In addition, the population of the less desirable shrub, narrowleaf low rabbitbrush, appears stable. The herbaceous understory is abundant and diverse. The only problem is the forb composition which is dominated by annuals and aggressive perennial increasers. Future trends will depend on compositional changes.

2001 TREND ASSESSMENT

Trend for soil is stable. Bare ground increased from 5% to 11%, but sum of nested frequency for perennial herbaceous species also increased. Protective cover from vegetation and litter remains well distributed over the site and erosion remains minimal. Trend for browse is stable. The most abundant species, mountain big sagebrush and snowberry, have stable densities and low decadency rates. The main negative factor is the decrease of young plants in 2001 which is likely caused by a combination of extended drought and competition with an abundant and weedy herbaceous understory. The more preferred but less abundant species, serviceberry and bitterbrush, have low but stable densities with little to no reproduction at the present time. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses increased while that of perennial forbs slightly decreased. The forb composition remains dominated by weedy increasers. Although annual forbs decreased in sum of nested frequency, they are still abundant.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 02 , Study no: 38

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'96	'01	'96	'01	'96	'01
G	Agropyron spicatum	265	264	73	74	12.38	7.47
G	Agropyron trachycaulum	70	*19	23	6	1.93	.53
G	Bromus marginatus	40	25	18	11	.79	.38
G	Bromus tectorum (a)	3	-	2	-	.06	-
G	Carex spp.	-	-	-	-	-	.03
G	Elymus cinereus	23	*9	7	5	1.04	.54
G	Melica bulbosa	9	*64	3	27	.06	.89
G	Poa bulbosa	33	50	7	14	1.62	1.22
G	Poa pratensis	162	*222	61	70	3.42	6.82
G	Poa secunda	27	*67	10	18	.46	.80
G	Stipa columbiana	9	13	3	4	.21	.21
Total for Annual Grasses		3	0	2	0	0.06	0
Total for Perennial Grasses		638	733	205	229	21.94	18.93
Total for Grasses		641	733	207	229	22.00	18.93
F	Achillea millefolium	16	10	5	5	.27	.10
F	Alyssum alyssoides (a)	173	*117	57	46	.85	.28
F	Artemisia dracunculus	-	-	-	-	-	.00
F	Arabis drummondi	3	-	2	-	.01	-
F	Aster spp.	9	-	5	-	.71	-
F	Balsamorhiza sagittata	2	6	2	3	.48	.86
F	Camelina microcarpa (a)	-	4	-	2	-	.01
F	Cirsium undulatum	3	-	2	-	.15	.00
F	Collomia linearis (a)	46	*94	24	41	.17	.25
F	Comandra pallida	22	14	9	7	.48	.09
F	Collinsia parviflora (a)	106	99	40	34	.30	.52
F	Crepis acuminata	5	7	2	4	.03	.19
F	Delphinium nuttallianum	10	3	4	2	.02	.01
F	Descurainia pinnata (a)	-	6	-	2	-	.01
F	Draba spp. (a)	3	-	2	-	.01	-
F	Epilobium brachycarpum (a)	99	*53	42	20	.66	.12
F	Galium aparine (a)	4	2	2	1	.03	.00
F	Hackelia patens	-	3	-	1	-	.00
F	Helianthella uniflora	5	9	3	3	.36	.27
F	Lappula occidentalis (a)	8	3	4	1	.07	.00

T y p e	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'96	'01	'96	'01	'96	'01
F	<i>Lactuca serriola</i>	18	3	6	2	.08	.03
F	<i>Lithospermum ruderales</i>	14	19	3	7	.24	.83
F	<i>Lupinus argenteus</i>	20	9	11	5	.38	.25
F	<i>Microsteris gracilis</i> (a)	46	54	23	25	.21	.22
F	<i>Polygonum douglasii</i> (a)	69	*22	29	10	.22	.10
F	<i>Senecio multilobatus</i>	5	9	1	3	.03	.04
F	<i>Taraxacum officinale</i>	4	-	2	-	.01	-
F	<i>Thlaspi montanum</i>	1	-	1	-	.00	-
F	<i>Tragopogon dubius</i>	88	94	45	41	1.08	1.20
F	<i>Veronica biloba</i> (a)	132	*18	43	8	1.38	.04
F	<i>Verbascum blattaria</i>	8	-	5	-	.07	-
F	<i>Wyethia amplexicaulis</i>	31	*58	18	23	3.81	6.89
Total for Annual Forbs		686	472	266	190	3.92	1.57
Total for Perennial Forbs		264	244	126	106	8.26	10.81
Total for Forbs		950	716	392	296	12.19	12.38

* Indicates significant difference at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 02 , Study no: 38

T y p e	Species	Strip Frequency		Average Cover %	
		'96	'01	'96	'01
B	<i>Amelanchier alnifolia</i>	1	1	.38	.15
B	<i>Artemisia tridentata vaseyana</i>	52	50	6.65	11.47
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	57	62	7.40	6.65
B	<i>Eriogonum heracleoides</i>	22	25	2.15	2.32
B	<i>Prunus virginiana</i>	5	6	.09	.33
B	<i>Purshia tridentata</i>	8	9	2.02	2.21
B	<i>Symphoricarpos oreophilus</i>	30	38	5.64	7.69
Total for Browse		175	191	24.35	30.85

BASIC COVER --

Herd unit 02 , Study no: 38

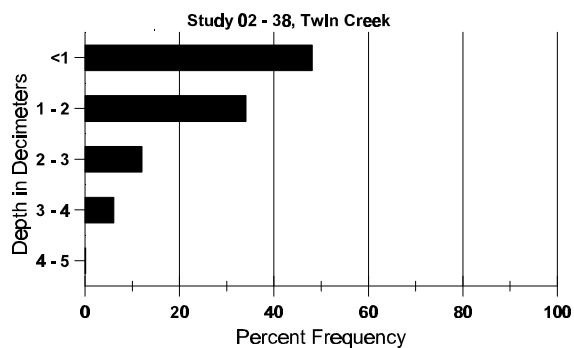
Cover Type	Nested Frequency		Average Cover %	
	'96	'01	'96	'01
Vegetation	470	457	53.65	58.72
Rock	260	138	5.68	2.70
Pavement	216	327	2.76	5.84
Litter	491	468	55.04	42.15
Cryptogams	40	27	.58	.55
Bare Ground	191	236	5.33	11.01

SOIL ANALYSIS DATA --

Herd Unit 02, Study no: 38, Twin Creek

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
13.0	58.4 (15.9)	6.3	42.9	32.1	25.0	6.5	38.4	278.4	.5

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 02 , Study no: 38

Type	Quadrat Frequency		Pellet Transect	
	'96	'01	Pellet Groups per Acre '01	Days Use per Acre (ha) '01
Sheep	2	-	-	-
Elk	28	18	539	42 (103)
Deer	4	5	78	6 (15)
Cattle	2	-	35	3 (7)

BROWSE CHARACTERISTICS --

Herd unit 02 , Study no: 38

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier alnifolia																		
M	96	-	-	-	-	-	1	-	-	-	-	1	-	-	20	35	25	1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	33	27	0
D	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	1	-	-	-	-	-	-	-	1	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			100%			00%			+ 0%							
'01		00%			100%			00%										
Total Plants/Acre (excluding Dead & Seedlings)															'96	20	Dec:	0%
															'01	20		100%
Artemisia tridentata vaseyana																		
S	96	14	-	-	-	-	-	-	-	-	13	-	1	-	280			14
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	96	11	1	1	-	-	-	-	-	-	12	-	1	-	260			13
	01	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	96	22	35	1	-	-	-	-	-	-	52	-	6	-	1160	27	43	58
	01	47	6	3	-	-	-	-	-	-	55	1	-	-	1120	33	49	56
D	96	-	1	1	-	-	-	-	-	-	2	-	-	-	40			2
	01	4	1	-	-	-	-	-	-	-	4	-	-	1	100			5
X	96	-	-	-	-	-	-	-	-	-	-	-	-	-	460			23
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		51%			04%			10%			-14%							
'01		11%			05%			02%										
Total Plants/Acre (excluding Dead & Seedlings)															'96	1460	Dec:	3%
															'01	1260		8%
Chrysothamnus viscidiflorus viscidiflorus																		
S	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	96	1	-	-	2	-	-	-	-	-	3	-	-	-	60			3
	01	8	-	-	-	-	-	-	-	-	7	-	-	1	160			8
M	96	105	-	-	-	-	-	-	-	-	103	-	-	2	2100	16	26	105
	01	98	-	-	1	-	-	-	-	-	98	1	-	-	1980	15	26	99
D	96	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	01	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			02%			+ 4%							
'01		00%			00%			.88%										
Total Plants/Acre (excluding Dead & Seedlings)															'96	2180	Dec:	1%
															'01	2260		5%

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Eriogonum heracleoides																		
M	96	41	-	-	1	-	-	-	-	-	42	-	-	-	840	8	22	42
	01	47	-	-	3	-	-	2	-	-	52	-	-	-	1040	8	21	52
D	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	01	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		00%			00%			00%			+19%							
'01		00%			00%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	860	Dec:	2%			
												'01	1060		2%			
Prunus virginiana																		
Y	96	2	2	-	2	-	-	-	-	-	6	-	-	-	120			6
	01	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
M	96	-	-	-	-	1	-	-	-	-	1	-	-	-	20	13	9	1
	01	5	-	-	1	-	-	-	-	-	6	-	-	-	120	22	25	6
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		43%			00%			00%			+46%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	140	Dec:	-			
												'01	260		-			
Purshia tridentata																		
Y	96	-	2	-	-	-	-	-	-	-	2	-	-	-	40			2
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	96	-	1	3	1	1	-	-	-	-	6	-	-	-	120	21	41	6
	01	-	-	6	1	-	-	-	-	-	7	-	-	-	140	25	35	7
D	96	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
	01	-	-	2	-	-	-	-	-	-	-	-	-	2	40			2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		44%			44%			00%			+ 0%							
'01		00%			89%			22%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	180	Dec:	11%			
												'01	180		22%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	96	5	-	-	1	-	-	-	-	-	6	-	-	-	120			6
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	96	17	6	9	19	-	-	-	-	-	45	-	6	-	1020	29	46	51
	01	46	-	-	3	-	-	-	-	-	48	1	-	-	980	32	49	49
D	96	2	-	2	-	-	-	-	-	-	2	-	-	2	80			4
	01	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
X	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'96		10%			18%			13%			-13%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'96	1220	Dec:	7%			
												'01	1060		8%			